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AF Note — 31

AGROFORESTRY NOTES

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Silvopasture Tree Pruning

Introduction

Silvopasture systems integrate forage production and tree production onto the same acres. The trees are planted and maintained significantly farther apart than in conventional pine plantations to allow enough light to reach the ground to support economical forage production. Widely spaced trees develop differently than a typical closed-canopy configuration. In a silvopasture, the producer's primary concern with open-grown trees is the management of large diameter branches that can reduce wood quality.

This *Agroforestry Note* discusses the proper timing and techniques for pruning trees in a silvopasture system that will yield trees of higher quality and value.

When to prune

Four factors determine when silvopasture trees should be pruned: trunk diameter, branch diameter, tree height, and season of the year.

Trunk Diameter

The object of pruning is to confine the knots created by the pruned branches to a small diameter (four inches) of core wood thereby producing high quality, knot-free wood on the outer portion of the tree trunk.

Consequently, prune trees periodically, never more than once per year, before a portion of the tree trunk grows larger than four inches in diameter.

Branch Diameter

Try to remove branches before they exceed two inches in diameter. Pruning wounds larger than this often take longer than one growing season to close. This results in increased consumption of the tree's energy to close the wound, a longer exposure time for pests to invade the wound, and greater potential to reduce wood quality in subsequent wood growth.

Tree Height

The relative portion of the tree height with branches, or live crown, affects the decision to prune in two ways. The first relates to the health and vigor of the tree and the second relates to the structural integrity of the tree and quality of its wood. Branches support the largest proportion of the energy-producing part of the tree, the needles or leaves. Removing too many branches removes leaves, weakening the tree, reducing growth, and making it more susceptible to insect and disease attack. During a single pruning operation, remove no more than one-third to one-half of the total crown. Branches on a tree trunk influence the form and development of the trunk. Trees with less than one-third live crown have poorer wood quality and develop weaker stems. Therefore, maintain a live crown of no less than one-third of the tree height.



Young trees in this silvopasture have been pruned to improve future wood quality and to allow sun light to reach the ground for adequate forage production. Photo courtesy Terry Clason.



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Initiate pruning when the crop trees reach 15 to 20 feet in height and the stump is 6 to 8 inches at a height of six inches above the ground. Schedule pruning operations periodically until the tree trunk is pruned to the height of a marketable log, often 18 feet. The goal of each successive pruning operation is to create a trunk which is free of branches once it becomes four or more inches in diameter.

Season Of The Year

The best time to prune living branches is late in the dormant season or very early spring before active growth begins. Correct timing gives the tree a full growing season to close the pruning wound.

How to prune

Pruning techniques for silvopasture trees follow the same guidelines as any other situation. To maintain tree health and wood quality, key considerations are to make a clean cut, not crushing the wood remaining on the tree, and cut the branch wood, not the trunk wood (see *Figure 1*). This requires sharp tools that are designed to easily cut a two inch or less diameter branch. Pruning equipment should be easy to handle, requiring only modest energy to cut a two inch diameter branch, and affordable.

Loppers or lopping shears with a scissor blade action work well for manual pruning. Some shears are equipped with a lever or cam action at the pruning head to minimize the force needed to cut through branches. Although more costly than the basic design, the reduced energy requirement may be important when many acres of trees must be pruned or if most of the branches are at the two inch diameter size.

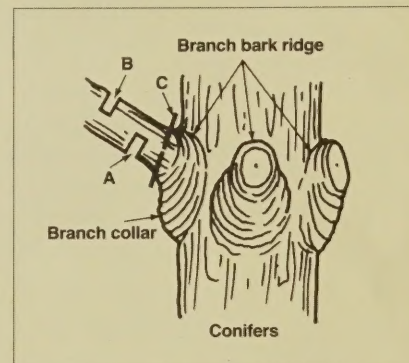


Figure 1. Proper pruning technique cuts only the branch wood, leaving the trunk wood to grow over and close the pruning wound. The three-cut method shown above reduces the risk of the pruned branch peeling trunk bark off as it falls. *Illustration courtesy Alex Shigo.*

Additional information

AF Note – 22: “From A Pasture To A Silvopasture System,” Robinson, James L. and Clason, Terry, 2000. USDA National Agroforestry Center.

“Home Owner’s Guide For Beautiful, Safe, And Healthy Trees,” Shigo, Alex, 1984. USFS, NE Region. NE-INF-58-84.

Author

Jim Robinson, USDA Natural Resources Conservation Service, National Technology Support Center, P.O. Box 6567, Fort Worth, TX 76115-0567. Phone: 817-509-3215.

Richard Straight, FS Lead Agroforester, USDA National Agroforestry Center, UNL–East Campus, Lincoln, NE 68583-0822. Phone: 402-437-5178, ext. 24; fax: 402-437-5712.



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Contact: USDA National Agroforestry Center (NAC), UNL–East Campus, Lincoln, Nebraska 68583-0822. Phone: 402-437-5178; fax: 402-437-5712; Web site: www.unl.edu/nac.

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